

We claim:

1 1. A graph engine for manipulating data in a database comprising:
2 a context engine operable to read information from one or more cells, each of the
3 one or more cells including a header and a payload, the header of each of the one or more
4 cells instructing the graph engine how to processes the cell;
5 a read engine operable to read data from the database by matching arguments
6 against entries in the database and returning results from the database; and
7 a write engine operable to write data into the database by creating an entry in the
8 database and writing data to that entry in the database.

1 2. The graph engine system of Claim 1 wherein the information in the
2 database is represented in memory in the form of graphs, the graphs being formed by one
3 or more sub-trees.

1 3. The graph engine of Claim 2 wherein the one or more sub-trees includes
2 profile data, differential bit matching and results.

1 4. The graph engine of Claim 1 wherein the read engine operates by reading
2 data from a location in memory and compares the contents of the memory location with a
3 search object, the read engine using the differential bits between the contents of the
4 memory location and the search object to locate subsequent memory locations in the
5 database.

1 5. The graph engine of Claim 1 wherein the write engine operates by
2 identifying the first differential bit between the contents of a memory location in the
3 database and a search object, and wherein the write engine is further operable to create a
4 new entry in the database by writing information beginning at the location of the first
5 differential bit.

1 6. The graph engine of Claim 1 wherein the manipulating of data in the
2 database is done using standardized database statements.

1 7. The graph engine of Claim 6 wherein the standardized database statements
2 are Structured Query Language statements.

1 8. The graph engine of Claim 6 wherein the standardized database statements
2 are Xtensible Markup Language statements

1 9. The graph engine of Claim 1 wherein the graph engine is able to processes
2 multiple cells representing multiple instructions by pipelining.

1 10. A method for manipulating data in hardware database using a graph
2 engine, the graph engine including a context engine, a read engine and a write engine, the
3 method comprising:

4 passing a search object and a location in a memory containing the database to the
5 context engine;

6 reading the information from a location in memory;

7 comparing the search object and the information using the read engine;

8 accessing additional locations in memory as a result of the comparison;

9 further comparing the search object to the additional locations in memory; and

10 returning a result based on the comparisons between the search object and the
11 memory location.

1 11. The method of Claim 10 wherein the result is a pointer to a new location
2 in memory, the new location in memory to be further compared to a new search object.

1 12. The method of Claim 10 wherein result is a piece of data stored in the
2 database.

1 13. The method of Claim 12 further comprising in place of returning a result
2 the step of determining the first differential bit between the search object and the
3 information in memory and writing new information to the database beginning at the first
4 differential bit.

1 14. The method of Claim 10 wherein manipulating the database is done using
2 standardized database statements.

1 15. The method of Claim 14 wherein the standardized database statements are
2 Xtensible Markup Language statements.

1 16. The method of Claim 14 wherein the standardized database statements are
2 Structured Query Language statements.

1 17. The method of Claim 14 wherein comparing the search object and the
2 information involves comparing differential bits between the search object and the
3 information.